2 INFORMATION AND ANALYSIS

2.1 Management of Information and Data

2.1a Types of Information and Data

SSCOM uses a variety of standard automated systems provided by the Army, the Department of Defense, or other Government agencies to process corporate data in such areas as financial, payroll, personnel and procurement. The Command has acquired or developed automated systems to manage data in Command-unique areas, such as project management, document tracking, labor reporting, resource planning, quality performance measurement and business process reengineering (Figure 2.1). We use these tools to analyze programs and allocate resources to meet mission criteria. User groups provide ongoing customer feedback with System Change Requests (DARCOM Form 2107) to identify detailed requirements.

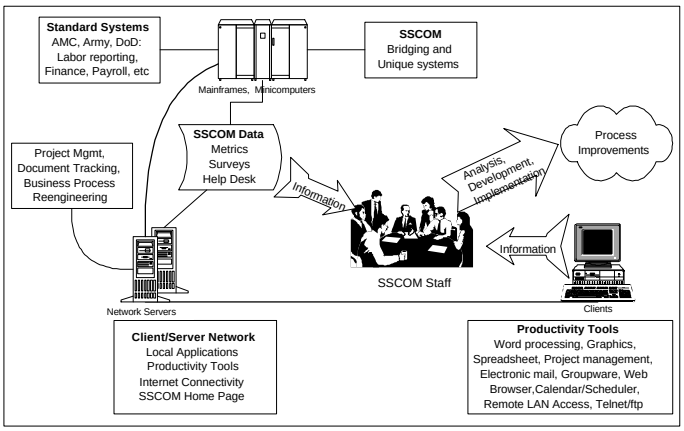

Figure 2.1. Information access and delivery

Government Performance and Results Act: Business Drivers and Goals. SSCOM is implementing the Government Performance and Results Act (GPRA). The GPRA Working Group, with membership from all levels of the organization, identified key performance indicators or metrics that best reflect meaningful measures of performance in achieving the goals (Figure 2.2). Our key business drivers and goals were developed by senior leaders (section 3.2).

Currently, SSCOM is expanding upon the NRDEC GPRA Key Metrics database to encompass the entire

SSCOM Organizations and Their Key Business Drivers	Goals (See Below)	Metric Categories: Acquisition Cycle Time	Best Value Contract Awards	Customer Orders	Customer Surveys	Partnering Agreements	Technology Accomplishments	Technology Transitions
HQ								
◆ Command and Control	1,2,3,4,5,6			✔			✔	
◆ Oversight and Policy	1,2,3,4,5,6	✔				✔	✔	✔
◆ Asset Management	2,4,5		✔				✔	
NRDEC								
◆ Develop Science and Technology Programs	1,2,5,6	✔	✔	✔	✔	✔	✔	✔
◆ Provide Engineering Support	1,2,5,6			✔	✔			
◆ Conduct Research and Development	1,2,5,6	✔		✔	✔	✔	✔	✔
PM-Soldier								
◆ Develop and Field Soldier Systems and Items	1,2,3,5,6	✔	✔	✔	✔			
◆ Enhance Equipment Capabilities	1,2,3,5,6				✔	✔	✔	✔
◆ Integrate Soldier Systems	1,2,3,5,6						✔	✔
◆ Establish Customer Requirements	5,6			✔	✔	✔		
PM-Soldier Support								
◆ Develop and Field Support Items	1,2,3,5,6	✔	✔	✔	✔			
◆ Enhance Equipment Capabilities	1,2,3,5,6				✔	✔	✔	✔
◆ Integrate Soldier Systems	1,2,3,5,6						✔	✔
◆ Establish Customer Requirements	5,6			✔	✔	✔		
Sustainment and Readiness Dir.								
◆ Manage stocked items	1,2,3,5	✔	✔					
◆ Promote ILS support for managed items	3,5,6	✔	✔					

SSCOM Goals

1 Integrate and deliver technologically superior items/equipment/systems to the warfighter.
2 Implement acquisition practices that mirror the best commercial practices of world-class private sector businesses.
3 Provide robust, flexible soldier systems logistics support
4 Provide for a quality infrastructure and quality of life and work environment for all employees.
5 Focus on quality and results for the customer.
6 Retain and expand our customer base.

Figure 2.2. Key business drivers, goals and supporting metric categories

Command. Some 500 metrics have been identified for inclusion from a variety of sources, as depicted in Figure 2.3. The data are to be extracted from the original source, ensuring data reliability and validity, as well as eliminating the need for employees to make data calls and manual intervention. Availability of this aggregated data will allow management and project officers to quickly analyze trends and prioritize projects.

The metrics are used to track actual performance against performance goals and provide data that our leaders and employees use to take appropriate actions to improve future performance. Results of metric tracking are shown throughout Chapter 6 and in section 7.4.

Validation and Verification. Two principal tactics are used to assure that metric data are validated and verified: first, ownership; and second, performance objectives. Each metric has two owners, an executive owner (or technical manager) in upper management and an operational owner or manager, a line-level

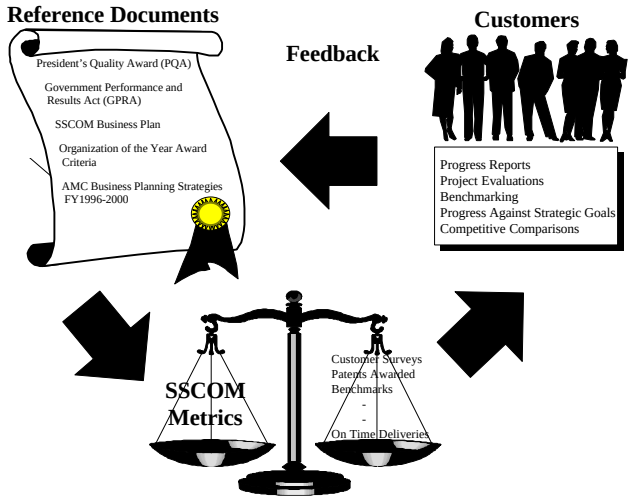

Figure 2.3. SSCOM performance measurement system

project officer. The operational manager collects and enters the data in the metrics database, while the executive owner reviews the data for integrity and validity. Directors of SSCOM's NRDEC directorates also share the responsibility for verifying the metrics data and, by their endorsement, are the validators of the information. Validation and verification of the metrics data and goals, along with customer satisfaction, are assured by incorporating these responsibilities into performance objectives in the Total Army Performance Evaluation System (TAPES).

Integrated Product Team Support. We use data and information to support the Integrated Product Teams (IPTs) (sections 3.2 and 5.1). Three of the numerous plans and data used to support IPTs are:

- Installation Master Plan, used to plan new construction and space allocation.
- Information System Plan (section 2.1b)
- PM-Soldier program management database, which provides support for PM-Soldier and the NRDEC. It tracks information for all tasks, including program funding, execution funding, quad charts, events, and points of contact. Users have the capability to quickly search the required information, update the database, and generate customized reports.

2.1b Improving the Selection, Analysis, and Integration of Data

In 1989, NRDEC used the IPT process and initiated development of an Information Systems Plan (ISP) to ensure the alignment of automated information systems with business priorities. After the formation of SSCOM, the ISP was revalidated. Eighteen "solution areas" or business application groupings were defined, and are numbered in priority order (Figure 2.4) based on their degree of support for the organization's key business drivers and the relationships among the information and data areas. Our progress in achieving milestones against the plan is reviewed quarterly by a Director-level Information Management Support Council.

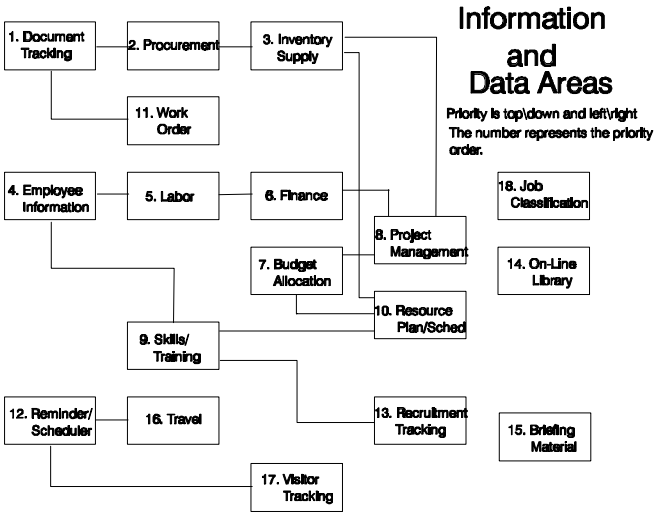

Figure 2.4. Information Systems Plan information and data areas

The goal of the ISP is to see that relevant information is available online, is collected only once and used many times, and is presented in a format that is appropriate for the viewer. To provide command-wide access to data and information, the first task undertaken in the ISP was the installation of a fiber optic Local Area Network (LAN). In addition to the original solution areas, after the installation of the LAN, we made commercial productivity software generally available to employees, including electronic mail, calendar/ scheduler, groupware, and remote LAN access. Recently, we added access to Netscape and placed an SSCOM home page on the World Wide Web as an information source for customers, suppliers, and employees. SSCOM is in the process of adding PM-Soldier, a site geographically separated from SSCOM headquarters, to the LAN.

To date, progress has been made in 11 of the 18 areas. Examples of significant progress are:

- Phase I of the Employee Data System provided

up-to-date personnel information on each employee at SSCOM and eliminated the need for paper records. Phase II, scheduled for deployment in the fall of 1996 provides a more user-friendly interface, additional functionality, and wider access.

- A system was developed to provide summary and detail procurement information critical to project managers. A more user-friendly system, which eliminates redundant data entry, is scheduled to replace it in the fall of 1996.
- A document tracking system, which uses electronic routing, is currently in use for personnel forms. Other forms are being added, starting with procurement documents, which will shorten the acquisition cycle.

2.2 Competitive Comparisons and Benchmarking

2.2a Comparisons and Benchmarking Selection

SSCOM employs a variety of techniques to compare and evaluate its performance with recognized leaders in the research and development community. These include:

- Peer reviews
- Reports to higher headquarters
- Independent evaluations
- Review of trade journals and market surveys
- Benchmarking of other government entities, universities and industrial organizations.

Benchmarking is an integral part of the SSCOM business cycle (Figure 3.2). Peer reviews include self-initiated and externally directed in-depth evaluations of the SSCOM technology and development programs. Self-initiated peer reviews are extensively employed to obtain expert evaluation of SSCOM technical activities and recommendations for improvement.

In the past five years, detailed external expert reviews have included:

- NRDEC Research Planning and Management, Scientific and Technical Advisory Services by the Army Research Office
- NRDEC Airdrop Program by A. D. Little, Inc.
- NRDEC Biotechnology Program by the Chief of Biotechnology, Wright-Patterson Air Force Base
- Suitability of NRDEC Technology Expertise, Facilities and Programs for Visiting Scientists by the National Research Council
- NRDEC Biomechanics Program by a team of experts from Johns Hopkins University, Boston University and Newington Children's Hospital.

In April 1994, the National Academy of Sciences' National Research Council established a NRDEC Standing Committee (NSC). The NSC consists of 12 prominent volunteer scientists and engineers who review and assess NRDEC on its technical programs, workforce, organizational structure, quality and customer satisfaction, and plans to advise on future directions for our strategic and business plans. They also review our progress in implementing our plans as well as the fulfillment of our mission.

Each study provides recommendations and an assessment of SSCOM quality and operational performance in relation to other Army Centers of Excellence and research laboratories in industry and academia. The NRDEC Senior Technical Advisory Council and the Executive Steering Committee set and prioritize goals for improvement, and actions to achieve those goals are incorporated into project plans in Integrated Product and Process Development (IPPD) (section 5.1).

Comparison of project plans with accomplishments and evaluation of the effectiveness of improvement efforts based on benchmarking data take place during The Integrated Planning Process (TIPP) (Figure 5.2) and quarterly reviews (section 2.3). Continuous improvement is the goal in every area. Product improvement is discussed in section 5.2 and results are identified in section 6.1.

In producing a special report on clothing and equipment used by foreign military forces, items in use by nine allied nations were examined (Australia, France, Germany, Italy, Japan, New Zealand, Norway, South Korea, and the United Kingdom). Those items which were innovative or unique were identified and analyzed by NRDEC product developers to determine their potential for use by the U.S. military forces. We tested promising candidates and some were adopted by the Army and the Marine Corps. Examples of this are a Neck Gaiter from Norway and kneeguards from Israel (section 7.4).

2.2b Evaluation of Benchmark Solutions; Use to Improve Organizational and Product Performance

SSCOM has formed a Benchmarking Process Action Team to provide definition, policy, and

procedures to improve on our existing benchmarking process. The existing NRDEC benchmarking process and the Picatiny Arsenal (1996 PQA winner) Benchmarking Desk Guide will be evaluated for inclusion and or expansion. Previous benchmarking efforts include:

- SSCOM benchmarked Motorola to develop the SSCOM IPPD process.
- The Information Management Directorate benchmarked Reebok Corporation, the Environmental Protection Agency and Hanscom Air Force Base regarding help desk operations.
- Force Provider (section 5.2b) benchmarked multiple program items against both domestic and foreign sources. Two specific subsystem components, the Containerized Batch Laundry and the Dispersed Water Storage and Distribution have yielded cost savings of $11.2M.
- SSCOM benchmarked state-of-the-art facilities, including the Biology Laboratory at MIT and the Glaxo R&D facility in North Carolina, prior to SSCOM laboratory renovations.
- PM-Soldier compares its requirements against the commercial market to determine the availability of products to fulfill customer needs (section 2.3).
- SSCOM's Public Works Directorate representatives visited Florida Power and Light (a Deming Prize winner) to benchmark like processes at SSCOM.
- *InfoWorld*, a national trade publication covering information technologies, picked SSCOM two years in a row as one of its top 100 Innovators in Client/Server technology. The "*InfoWorld* 100" ranked SSCOM # 30 in 1995, up from # 55 in 1994. Researchers from Trish Information Services, in Hayward, California interviewed some three hundred companies regarding information systems plans to come up with the top 100. Only one other government agency is on the list (Figure 2.5).

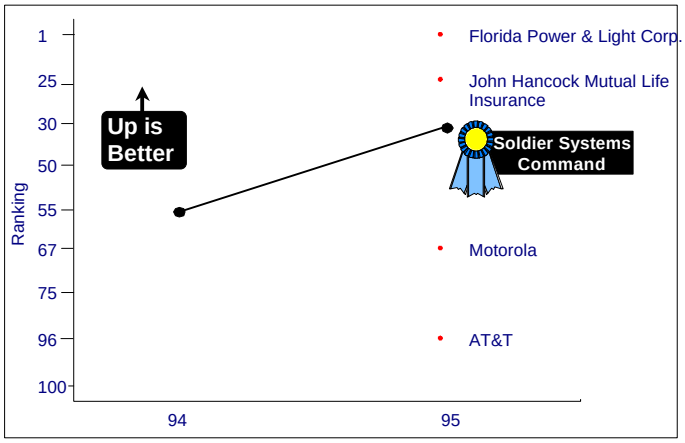

Figure 2.5. SSCOM makes "*InfoWorld* 100" list.

2.3 Analysis and Use of SSCOM-Level Information

2.3a Key Performance and Customer Satisfaction Data

SSCOM leadership uses well-defined processes and management forums from multiple sources to gather quality customer, operational, and organizational data. These data are linked to our key business drivers for planning and translation of quality and performance metrics (Figure 2.2).

Quarterly Reviews. We develop project plans from requirements received from our customers. SSCOM performs quarterly reviews of project plans, financial data, infrastructure requirements, automation, facilities, and equipment. We make adjustments and verify or change priorities as a result of the review process. The data users communicate information across organizational lines to the appropriate directors and to process owners through a system of reviews and online/hardcopy data. Step 5 in Figure 3.2 illustrates this relationship within the SSCOM business cycle.

Surveys. The Operational Forces Interface Group (OFIG) is the organization responsible for personal interface with the soldier. They conduct 8 to 12 site visits a year. In each visit the group surveys 300 to 400 soldiers, returning from major field exercises. OFIG collects data to determine the adequacy of the food, clothing, and equipment used in the field. Additionally, OFIG visits the returning unit's central issue facility to collect data on potentially defective equipment or clothing.

At the completion of every field survey the group aggregates the data and reports to top management, project officers, and customers. Top management uses performance trends from this data to determine viability and prioritization of existing and planned projects. They also build process improvements into strategic and business plans based on the analysis of the data. Project officers utilize these data to correct deficiencies.

As a result of continuous customer feedback, such as that from Operation Desert Shield/Desert Storm, the Meal, Ready-to-Eat (MRE) Program has undergone major improvements over the last five years (section 7.4). These improvements expand variety for soldiers and improve acceptability, consumption, and nutrition intake to enhance performance on the battlefield.

SSCOM's behavioral scientists develop and analyze customer surveys and report the results to management, project officers, and back to customers (section 7.4). In-depth survey results are used as input to the prioritization process. Telephone interviews or subsequent surveys ensure that recommendations and solutions that result from the surveys are meeting the needs of the customer. This ensures continuous process improvement.

At the present time, SSCOM has conducted two in-depth morale surveys throughout the organization to improve both services and morale, welfare and recreational (MWR) activities. As a result of the first survey, infrastructure and quality of life deficiencies were identified (section 4.4).

Top management and Team Morale have partnered in an effort to respond to survey results and ensure continuing improvement of identified deficiencies. Results are shown in section 6.3, Figure 6.38.

Decision Support and Analysis. PM-Soldier and NRDEC have teamed to implement decision support analysis that assists in the decision making process for all PM-Soldier projects. The team members analyze data related to quality, customers, and operational performance together with financial data to support SSCOM decision reviews, actions, and planning.

PM-Soldier utilizes both formal and informal market surveys of like industry items to create competitive comparison and benchmarking of individual soldier items for procurement. An example is the development of the Modular Load Bearing and Body Armor Program (section 6.1) by PM-Soldier's Clothing and Individual Equipment Team. PM-Soldier was provided with a Requirement Document, which was the product of an Integrated Product Team (IPT) consisting of customers from the Army, Marine Corps, and Special Forces, as well as direct involvement from NRDEC. A front-end analysis identified that there was no technology available to meet the requirements. A market survey was then conducted, which indicated there were no commercial products available. Based on the results of these analyses, SSCOM initiated a program to develop the required items.

As an outcome of calls to the Help Desk—from as far away as Hungary—we have identified specific computer training, software, and hardware needs among employees. One example is the additional electronic mail training now offered to the SSCOM workforce.

2.3b Key Performance, Customer and Financial Data

Funds are allocated based on stated program goals designed to meet customer needs. Customer expectations are then translated to what we say we can do within the funding provided. Program reviews (Figure 7.3) are typically focused on what program objectives have been accomplished, whether they meet customer needs, and what part of the program has yet to be accomplished (unobligated funds). Obligation rates against funding provided becomes important to customers as well as Army Materiel Command (AMC) and Department of the Army (DA). During the fiscal year of the program execution, obligation rates are the single most important performance measure reviewed by AMC and DA (section 6.2, Figure 6.24). If particular programs lag behind those goals, AMC will likely reallocate funding to one of many high priority programs outside of SSCOM. During quarterly reviews, management may direct program shifts based on an inability to obligate the majority of program funds by the end of the third quarter.

Customer orders are a key metric which provide an indicator of customer satisfaction. Figure 7.12 shows a steady growth in customer demand in spite of a continuing decline in available defense dollars. In particular, we project a 17% increase from fiscal year 1995 to fiscal year 1996. For SSCOM, the best indicator of customer satisfaction is receiving an increased proportion of their budgets for continuous improvement of soldier systems.